

Claims

[c1] A machine, comprising:

- an elongate conveyor system for transporting items to a hopper;
- a printing and drying station where ink is applied to said items and dried;
- an elongate discharge apparatus;
- said elongate discharge apparatus including a plurality of longitudinally-spaced apart deflectors for diverting preselected items from a first path of travel to a second path of travel;
- said elongate discharge apparatus including a plurality of bins, there being as many bins as there are deflectors;
- said elongate conveyor system and said elongate discharge apparatus being disposed in parallel relation to one another;
- said printing and drying station being disposed in inter-connecting relation to said elongate conveyor system and said elongate discharge apparatus;
- a first end of said printing and drying station being positioned at a discharge end of said elongate conveyor system;
- a second end of said printing and drying station being

positioned at an input end of said elongate discharge apparatus;

said elongate conveyor system, said printing and drying station, and said elongate discharge system collectively forming a square "U"-shaped configuration;

whereby an operator of said machine has unimpeded access to said elongate conveyor system, said printing and drying station, and said elongate discharge apparatus.

[c2] The machine of claim 1, further comprising:
a sensor including a signal-generating means that controls an instantaneous position of each deflector of said plurality of deflectors so that a preselected group of items may be diverted to a particular bin of said plurality of bins.

[c3] The machine of claim 1, further comprising:
each deflector of said plurality of deflectors having a first position and a second position;
said first position of each deflector being disposed in non-interfering relation to said first path of travel of an item so that said item remains on said first path of travel after passing said deflectors;
said second position of each deflector disposed in interfering relation to said first path of travel of said item so that said item is diverted to said second path of travel upon encountering said deflectors in said second posi-

tion.

[c4] The machine of claim 3, further comprising:
each deflector of said plurality of deflectors being pivotally mounted;
a solenoid having an actuator linked to each deflector;
said solenoid having an inactivated state where said actuator maintains each deflector in said first position; and
said solenoid having an activated state where said actuator causes pivotal motion of each deflector and places each deflector in said second position.

[c5] The machine of claim 4, further comprising:
a plurality of elongate O-rings rotatably mounted along said second path of travel in parallel, vertically spaced apart relation to one another;
a plurality of elongate flat belts rotatably mounted along said second path of travel in parallel, vertically spaced apart relation to one another;
said plurality of O-rings disposed in confronting relation to said plurality of flat belts;
said plurality of O-rings and said plurality of flat belts rotating in opposite directions at a common speed so that an item sandwiched between them is transported along said second path of travel;
each O-ring of said plurality of O-rings having a position of repose and being inherently resilient so that each O-

ring of said plurality of O-rings quickly returns to said position of repose when displaced away from said position of repose and then released;

a plurality of vertically spaced apart protruding rollers positioned in protruding relation to said second path of travel so that an item traveling along said second path of travel is constrained to deviate from said second path of travel upon encountering said plurality of protruding rollers;

said items, upon deviating from said second path of travel, causing said O-rings to displace from their respective positions of repose;

the inherent resiliency of each O-rings of said first plurality of O-rings snapping a trailing end of said leading item back into the second path of travel as each item clears the protruding rollers so that the trailing end of each item does not interfere with the leading end of an item in trailing relation to said leading item.

[c6] The machine of claim 5, further comprising:

a nip defined by a pair of opposed rollers;

said nip being longitudinally spaced apart from and disposed between said protruding rollers and a discharge bin of said plurality of discharge bins;

each item having a first rate of travel that is slowed to a second rate of travel as its leading end encounters said

nip;

said opposed rollers of said nip cooperatively rotating in opposite directions with one another at a common speed to feed said items toward a discharge bin of said plurality of discharge bins.

[c7] The machine of claim 6, further comprising:
a vacuum block mounted downstream of said protruding rollers, between said protruding rollers and said nip;
said vacuum block applying a suction to respective trailing ends of items that are slowing down from said first rate of travel to said second rate of travel as the respective trailing ends of said items clear said protruding rollers and are snapped out of the way of items
whereby said respective trailing ends of said items traveling from said protruding rollers to said nip are subjected to a vacuum and thus any bouncing of said items caused by the snapping action of the O-rings is inhibited.

[c8] The machine of claim 6, further comprising:
an air nozzle mounted downstream of said protruding rollers, between said protruding rollers and said nip;
said items being envelopes having flaps;
said air nozzle applying a positive air pressure to respective flaps of envelopes that are slowing down from said first rate of travel to said second rate of travel as the

respective trailing ends of said envelopes clear said protruding rollers and are snapped by said O-rings out of the way of the respective leading ends of the trailing items;

whereby said respective flaps are pushed into overlying relation to a main body of said envelopes so that said flaps are not rammed by the flaps of said trailing items.

[c9] The machine of claim 6, further comprising:
a sensor positioned in substantial registration with said protruding rollers that determines whether two contiguous items are longitudinally spaced apart from one another by a predetermined distance;
said sensor operable to stop rotation of said opposed rollers of said nip for a predetermined period of time if the gap between said two contiguous items is greater than said predetermined distance so that said gap is shortened to a distance within said predetermined distance.

[c10] The machine of claim 1, further comprising:
a pivotally-mounted friction belt positioned with respect to said hopper such that an item in said hopper is substantially fully engaged along its length when said pivotally-mounted friction belt is in a fully unpivoted position and such that an item in said hopper is engaged only at a leading end thereof when said pivotally-

mounted friction belt is in a fully pivoted position;
said pivotally-mounted friction belt being positionable in an infinite number of pivotal positions of adjustment between said fully unpivoted and fully pivoted positions;
the amount of driving force imparted to envelopes exiting said hopper being variable by adjusting the amount of pivoting of said pivotally-mounted friction belt.

- [c11] The machine of claim 1, further comprising:
a separator sheet feeder positioned downstream of said printing and drying station and upstream of said elongate discharge apparatus;
said separator sheet feeder adapted to insert a separator sheet between contiguous bundles of said items.